

IN THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. (Currently amended) A process for manufacturing composite structural insulated panels comprising:

sequentially depositing lower boards on a conveyor of a conveying system between a pair buttresses that extend away from the conveyor and transporting the lower boards via [[a]] the conveying system through an application zone wherein a multi-barrel extruder system mixes and applies a catalyzed foam mixture to one face of each successive lower board, the catalyzed foam mixture expanding upon application on the lower boards;

sequentially depositing upper boards over the catalyzed foam mixture as it expands while the lower boards are transported from the application zone via the conveying system on a pair of stationary support rails at a desired height above the conveyor, the buttresses positively driving the upper boards along the pair of stationary support rails at a complementary position over the respective lower boards and expanding catalyzed foam mixture;

continuing to transport the lower boards, expanding foam mixture, and upper boards via the conveying system through a curing apparatus such that structural insulated panels are formed having a foam core of a selected thickness that is adhered to upper and lower boards.

2. (Currently amended) The process of claim 1, wherein a lower board placement device is used to position the lower boards on the conveying system conveyor.

3. (Original) The process of claim 2 wherein an upper board placement device is used to sequentially deposit upper boards on the catalyzed foam mixture as it expands while the lower boards are transported from the application zone via the conveying system.

4. (Original) The process of claim 1, wherein upper and lower boards selected from the group comprising oriented strand board, gypsum board, plywood, waferboard, or any combination thereof are sequentially transported and sequentially deposited, respectively.

5. (Original) The process of claim 1, wherein upper and lower boards having a thickness of 7/16 inch (11.1 mm) are sequentially transported and sequentially deposited, respectively.

6. (Original) The process of claim 1, wherein a catalyzed foam mixture to form a polyurethane or polyisocyanurate foam is applied to one face of each successive lower board.

7. (Currently amended) The process of claim 2 wherein ~~the lower boards are placed on a conveyor using the lower board placement device and~~ the conveyor transports the lower boards through the foam application zone.

8. (Currently amended) The process of claim 3 wherein ~~the lower boards are placed on a conveyor using the lower board placement device,~~ the conveyor transports the lower boards through the foam application zone and the conveyor transports the lower boards with the catalyzed foam mixture applied thereon through the upper board placement device.

9. (Original) The process of claim 8 wherein the conveyor transports the lower boards with the catalyzed foam mixture applied thereon and the upper boards deposited thereon through the curing apparatus.

10. (Original) The process of claim 9 wherein the conveyor moves continuously at a rate of 20 to 60 ft./min.

11. (Original) The process of claim 10 wherein a catalyst is mixed with other foam making ingredients as a last mixing step before depositing the catalyzed foam mixture onto the lower boards.

12. (Cancelled) The process of claim 10 wherein the sequentially transported lower boards maintained at a spaced separation and are positively driven by buttresses that project from the conveyor.

13. (Cancelled).

14. (Original) The process of claim 1 wherein continuing to transport the lower boards, expanding foam mixture, and upper boards via the conveying system through a curing apparatus comprises transport through heating and cooling sections of the conveying apparatus.

15. (Original) The process of claim 1 further comprising trimming the structural insulated panels and cutting them into pieces of a desired size.

16-27. (Canceled)

28. (Previously presented) The process of claim 1, wherein the multi-barrel extruder system has a single dispensing head for depositing the catalyzed foaming mixture on the lower boards.

29. (Previously presented) The process of claim 1, wherein each barrel of the multi-barrel extruder system has an associated reservoir for introducing foam ingredients into the extruder barrels.

30. (Previously presented) The process of claim 29, wherein the foam mixture further comprises isocyanate, polyol, foaming agent, and catalyst.

31. (Previously presented) The process of claim 30, wherein the catalyst is provided from an associated reservoir to a dispensing head.

32. (Currently amended) A process for manufacturing composite structural insulated panels, each structural insulated panel having an upper board, a lower board, and a foam mixture therebetween, the process comprising:

sequentially depositing lower boards on a conveyor of a conveying system and transporting the lower boards via [[a]] the conveying system through an application zone wherein a catalyzed foam mixture is applied to one face of each successive lower board;

the catalyzed foam mixture expanding upon application on the lower boards;

the conveying system comprising a pair of stationary support rails to keep the upper boards at a desired height and placement above the respective lower boards;

sequentially depositing the upper boards on the pair of stationary support rails of the conveying system at a complementary position over the lower boards

and the expanding foam mixture as the lower boards are transported from the application zone ~~via~~ of the conveying system; and

continuing to transport the lower boards, expanding foam mixture, and upper boards via the conveying system through a curing apparatus such that structural insulated panels are formed having a foam core of a selected thickness that is adhered to upper and lower boards.

33-34. (Cancelled)

35. (New) The process of claim 32, wherein the lower boards are deposited on the conveying system between a pair of buttresses that extend away from the conveyor, and the buttresses positively drive the upper boards along the pair of stationary support rails at a complementary position over the respective lower boards and catalyzed foam mixture.